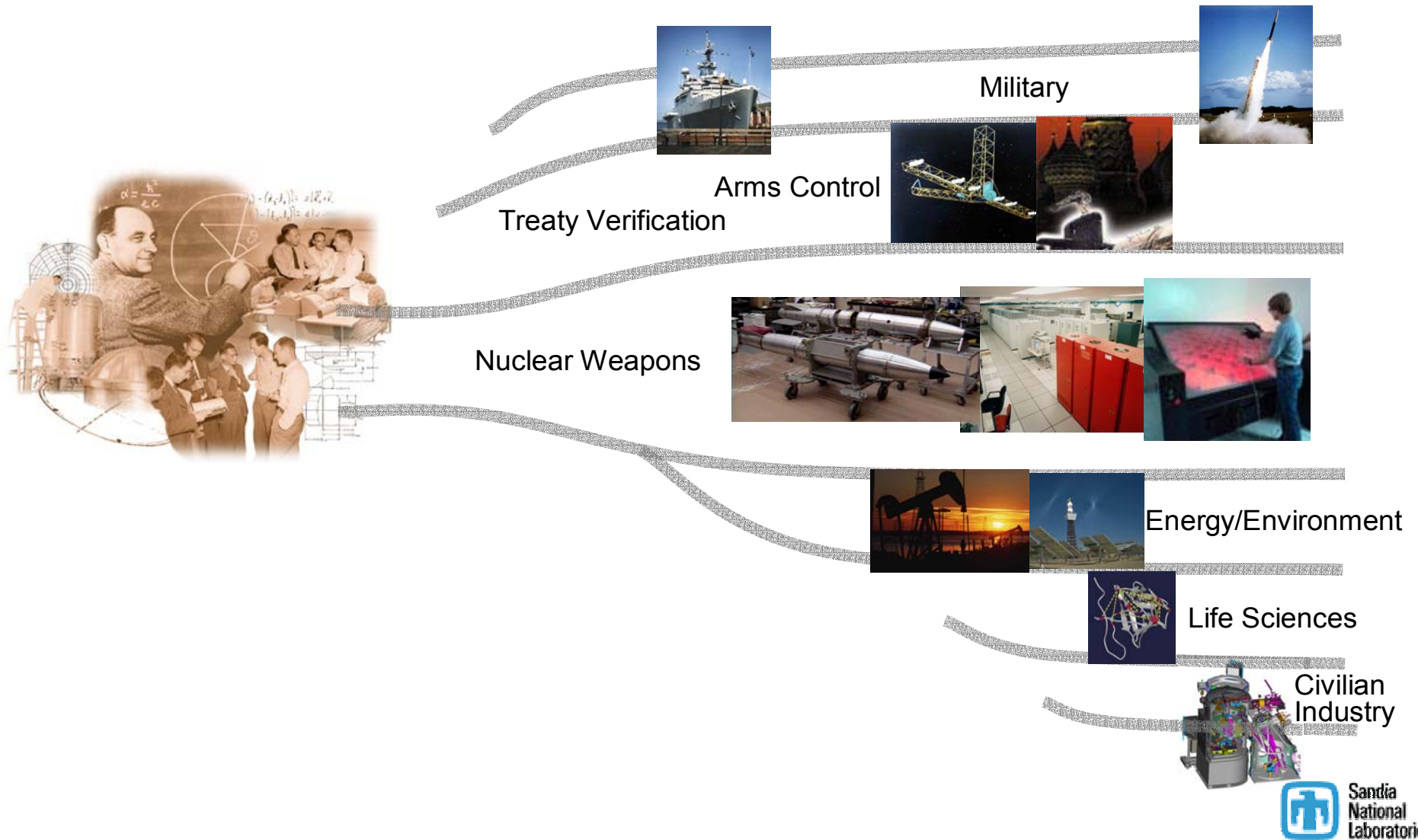


A View from Inside an NNSA Lab

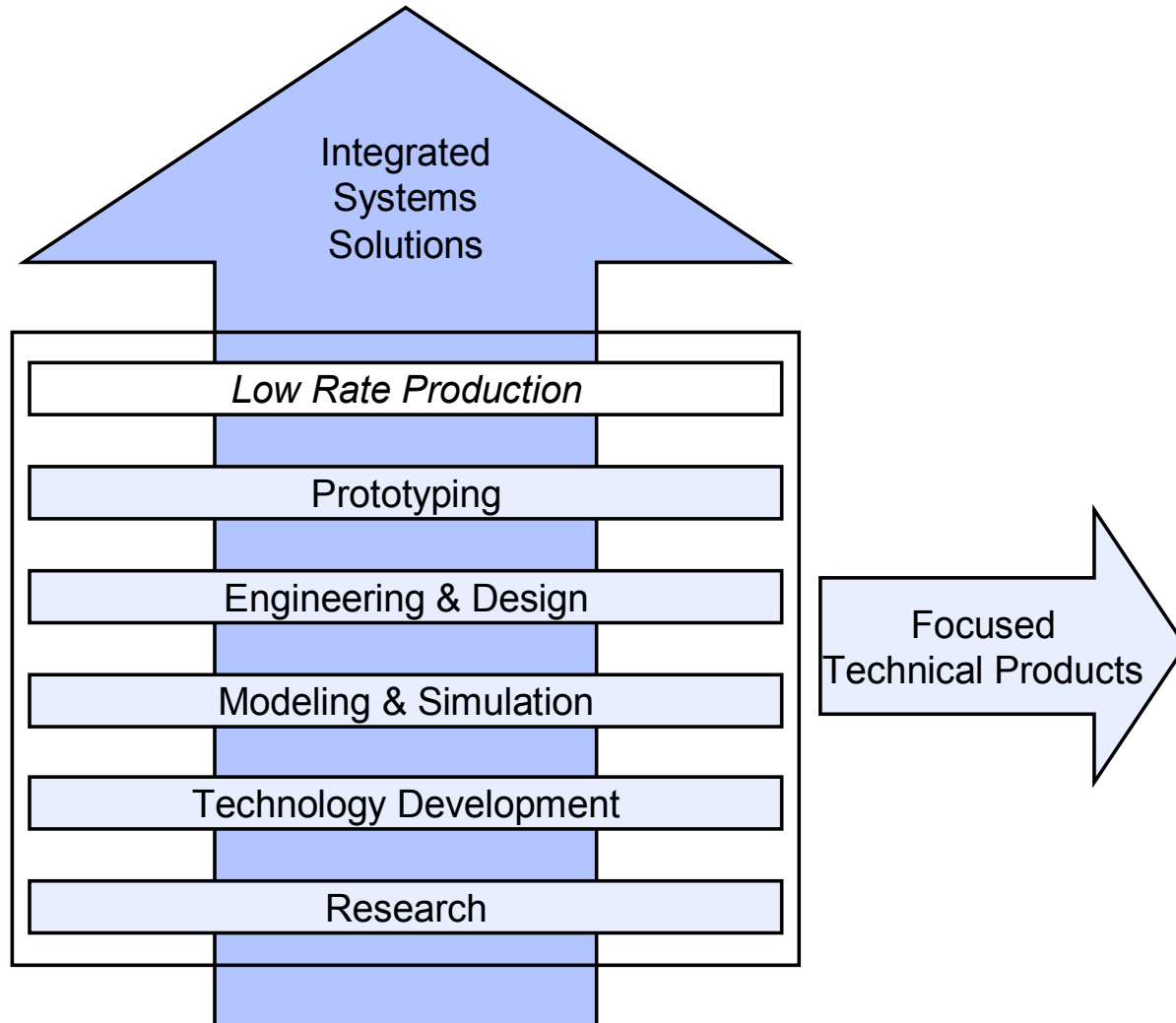
Presentation to
The Workshop on National Laboratories and Universities:
Building New Ways to Work Together

Mim John
VP, California Division
Sandia National Laboratories
July 10, 2003

A heritage of technical solutions to the nation's most challenging national security problems



Laboratory solutions derive from diverse multi-disciplinary capabilities



Originally, most work was classified

1950's

Unclassified

Classified

systems
analysis



national nuclear
policy

threats

effectiveness
measures, targeting

exploratory
concepts



military operational
guidance

weapon characteristics

gas
transfer
component
design



H₂ storage

H₂ material effects

weapon applications

Gradually, our products relied upon a mix of classified and unclassified information

1970's - 1980's

Unclassified

Classified

systems
analysis



national nuclear
policy

threats

effectiveness measures,
targeting

exploratory
concepts



military operational
guidance

weapon characteristics

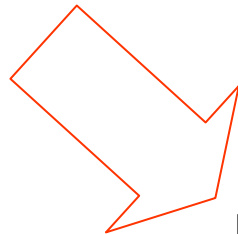
gas
transfer
component
design



H₂ storage

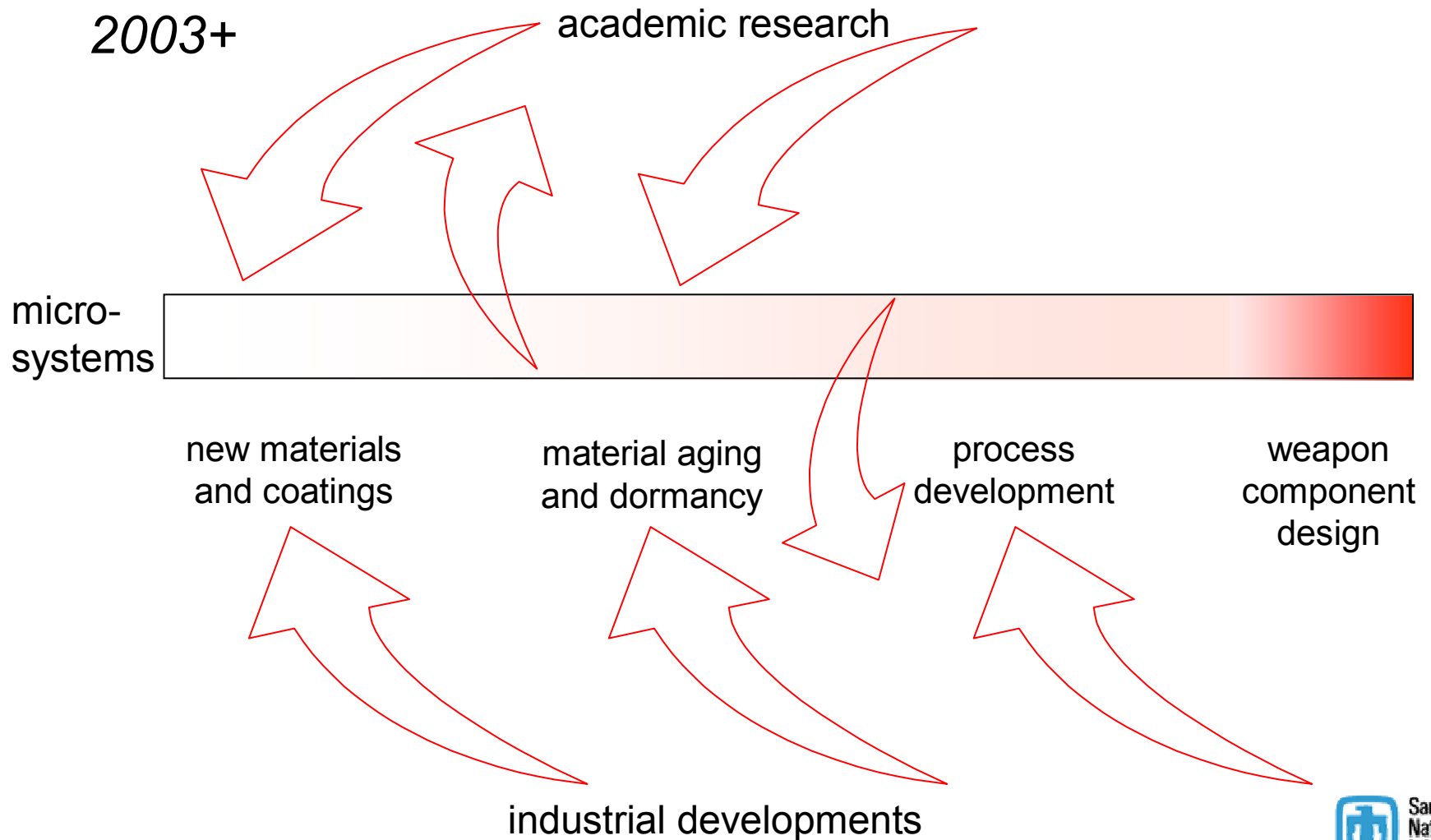
H₂ material effects

weapon applications



H₂ energy

Today - and as we look to the future - most technology and science for our work is developed cooperatively as part of a global enterprise



Challenges for the future:



- attracting and retaining the best and brightest when many of them will be foreign born



- continuing to protect critical classified information in the fast moving information technology world



- ensuring a work environment for excellence in developing and acquiring knowledge and in applying it to our national security deliverables
 - maintaining the ability to interact with the worldwide science and technology community
 - adopting an adaptive and graded security approach
 - performance-based vs. rule-based*

*See Commission on Science and Security, John J. Hamre Chairman, *Science and Security in the 21st Century: A Report to the Secretary of Energy on the Department of Energy Laboratories*. Washington, DC: April 2002.

Scientific Exchange

- Perception: *Scientific collaborations between the NNSA labs and industry, universities, foreign scientists have dramatically declined.*
- Realities:
 - Barriers and requirements are greater than they ever have been (FN visits, conference attendance, travel restrictions, LDRD, line item budgeting...)
 - We have maintained healthy FN post-doc and visitor programs
 - Industry partnerships remain strong
 - Academic collaborations are healthy - even in the weapons program (e.g., ASCI)

Unclassified/Classified Research - Within the Labs

- Perception: *Individuals at the NNSA labs doing classified research are - and should be - segregated from unclassified work.*
- Realities:
 - Most staff in NNSA research have always engaged in both classified and unclassified work, the latter essential to staying at the forefront of S&T - the former tying their focus to critical national security applications
 - Congress and many in DOE have limited understanding of the realities of the S&T enterprise, internal or external to the laboratories

Unclassified/Classified Research - University Ties

- Perception: *The NNSA labs underutilize university ties and collaborations.*
- Realities:
 - Academic community - with a few exceptions - has maintained support for and ties with the NNSA labs
 - For the labs to remain effectively engaged, however, we have to collaborate and support academia in turn, much like industry is doing - e.g., funding research, sharing facilities, collaborating programmatically and providing students
 - DOE/Nuclear Weapons Program has maintained an effective, but increasingly pressured, education outreach program throughout the decade
 - FN interactions have become bureaucratically difficult since 1999

Retention and Recruiting

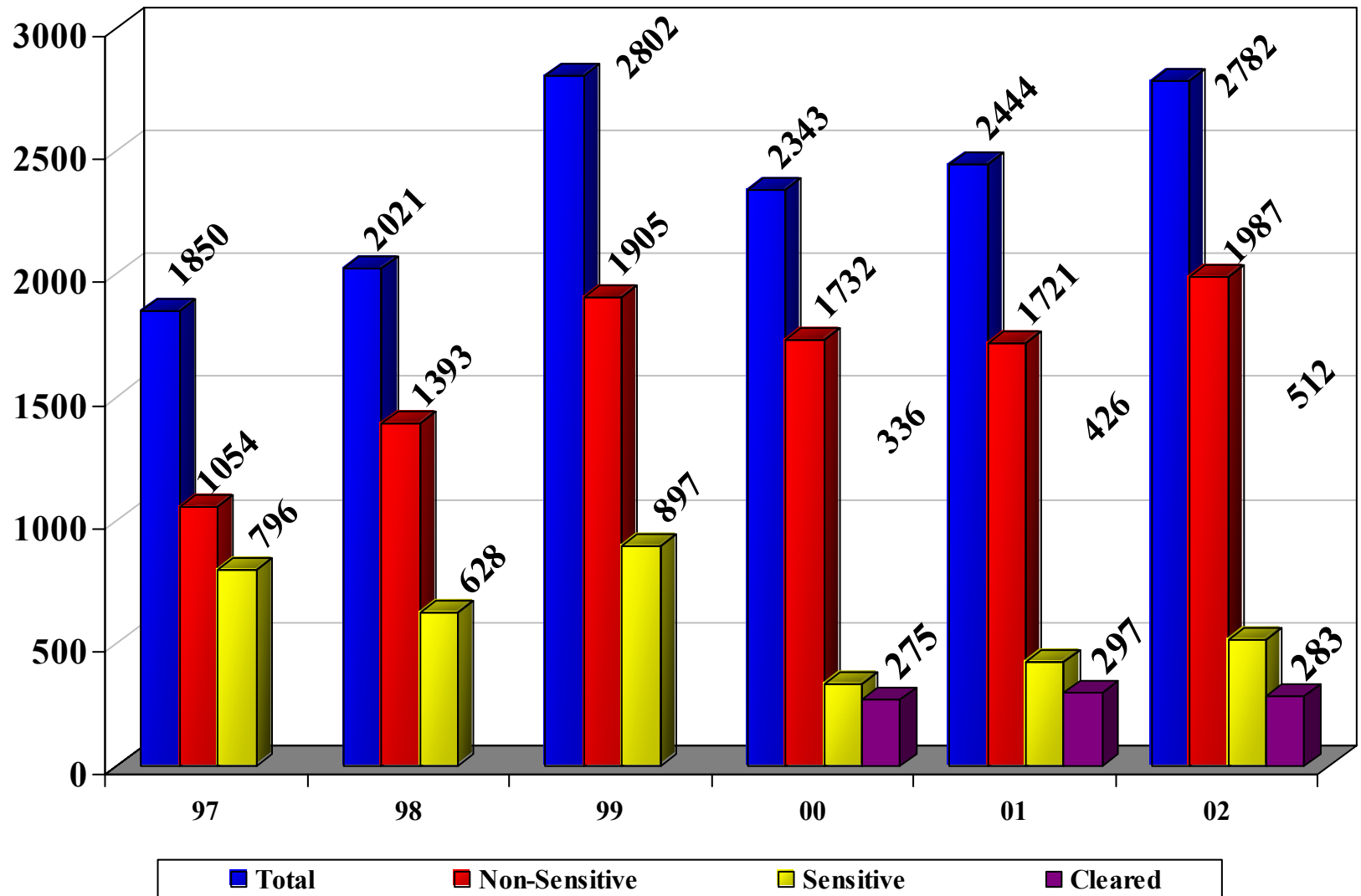
- Perception: *The NNSA labs are no longer able to attract the best and brightest, nor keep those already there.*
- Realities:
 - We - like all other technical institutions - are recruiting from a shrinking pool of US talent
 - We endured the “dot.com” boom with only moderately elevated attrition rates. Current voluntary (non-retirement) separations ~3%
 - We are maintaining high hiring standards
 - A few faculty have discouraged students to work at the NNSA labs
 - We’re creating opportunities for highly qualified FNs who want to become US citizens through extended term appointments
 - Assistance programs for green card applications
 - Conversion opportunities with citizenship
 - Physical and cyber access

Summary

- Majority of work at NNSA labs is not classified
- Quality and retention of staff continues to be high
- All labs have small, but growing FN populations
- University ties are good but can be improved through more deliberate and sustained partnerships
 - Most ties are at the tactical (PI to PI) level
 - Labs don't have the financial flexibility of industry, but do have great facilities and excellent staff
 - We should consider jointly pursuing "Center of Excellence" models

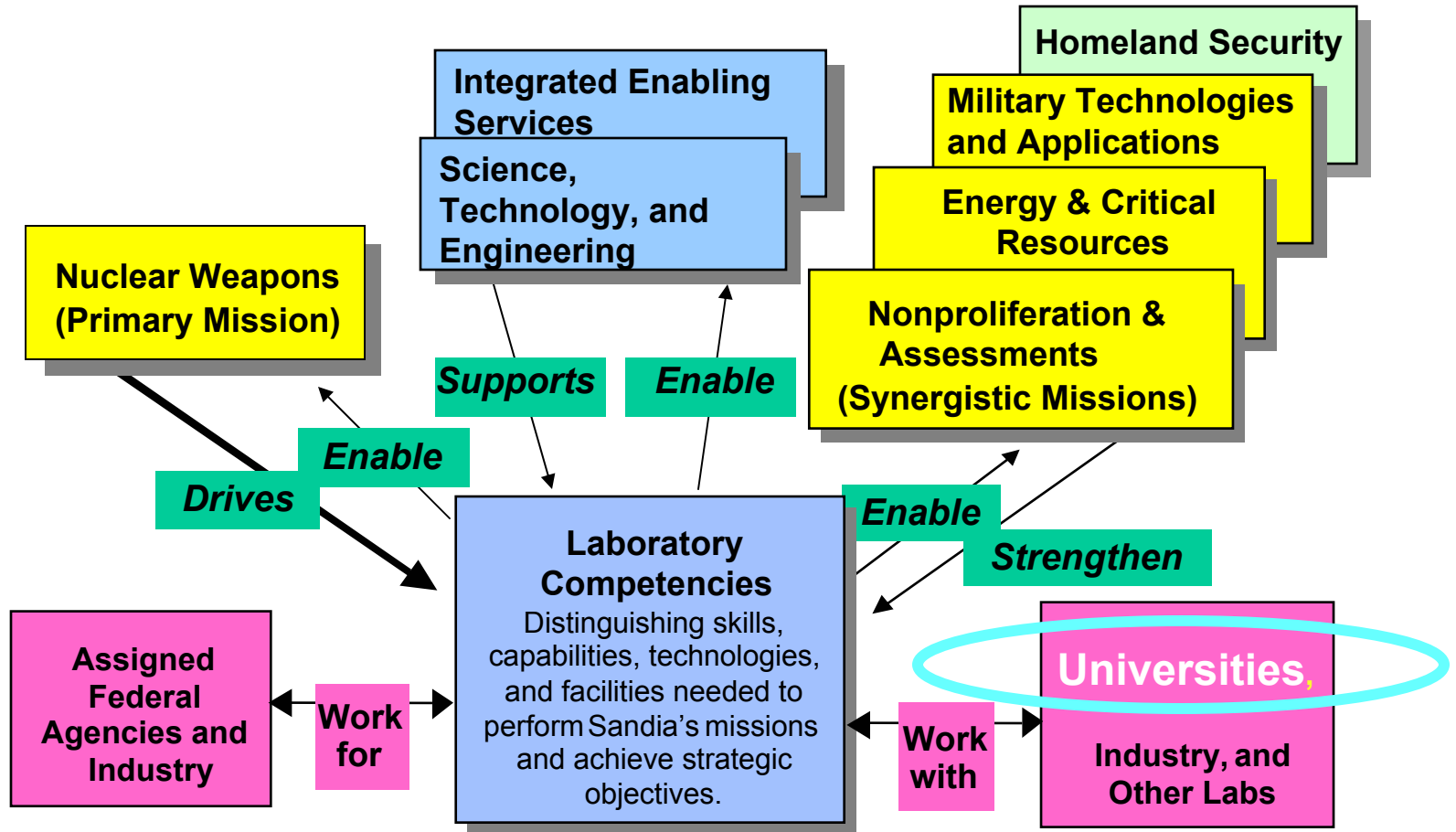
Backup Information

The number of foreign nationals visiting Sandia is significant



**CY00-CY02 Data Includes Cleared Foreign Nationals and Requests Withdrawn*

Sandia CA mission needs drive university partnerships & investments



Partnerships, both regional and national, provide us with scientific and programmatic leverage; some Sandia CA examples:

- **Laboratories**

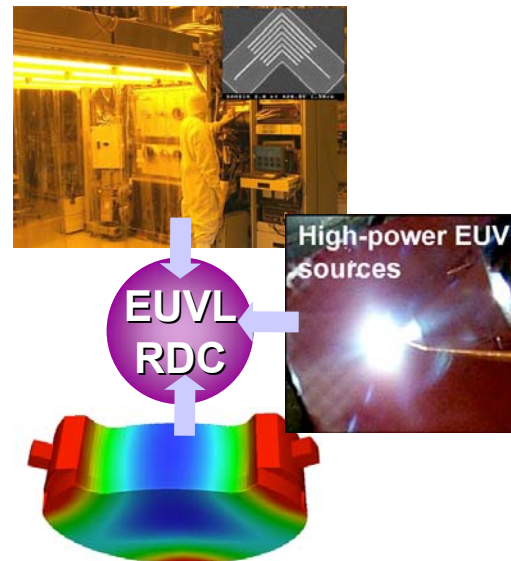
- LLNL
- LANL
- LBNL
- ANL
- ORNL
- PNNL
- ...

- **Industry**

- EUVL Consortium
- Waters Company
- Gas Technology Institute
- General Motors
- ...

- **Universities**

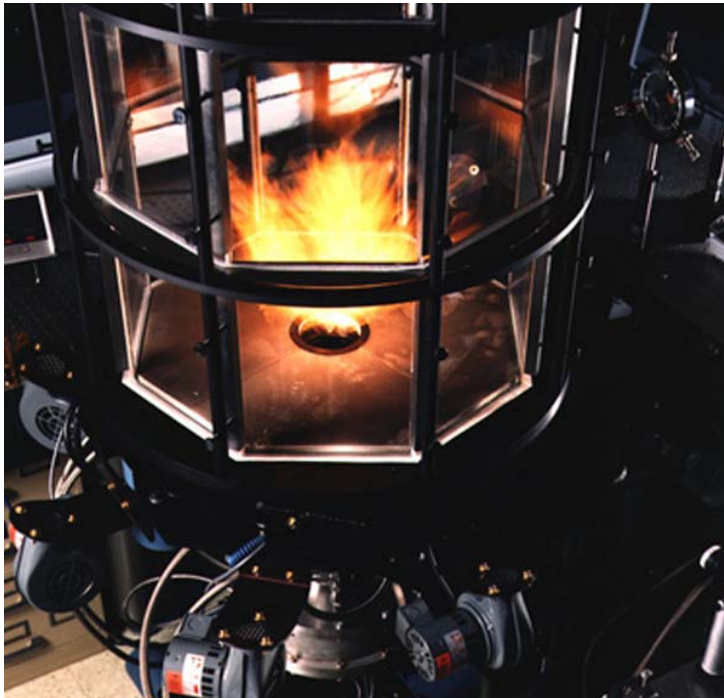
- Bio (Stanford, UC Berkeley, UCSF, ...)
- Cyber (U. New Haven, Naval Postgraduate School, UCD, ...)
- Engineering Sciences (Cornell, Georgia Tech, UC Berkeley, ...)
- Combustion (Yale, Penn State, Johns Hopkins, ...)



Bio-technology Partners

The Combustion Research Facility (CRF) focuses on science and technology issues critical to the DOE mission

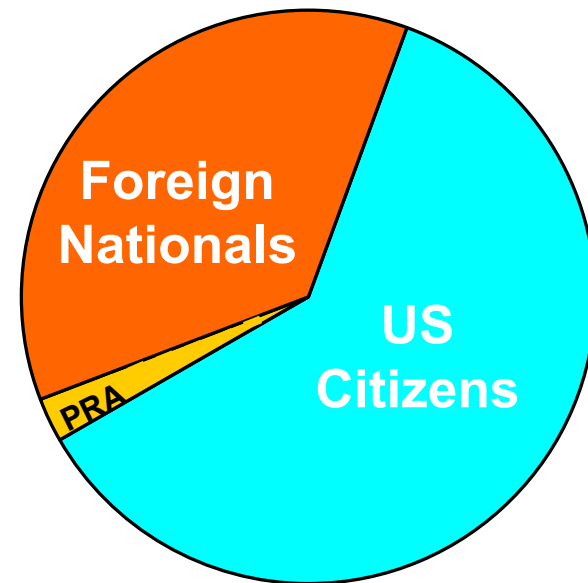
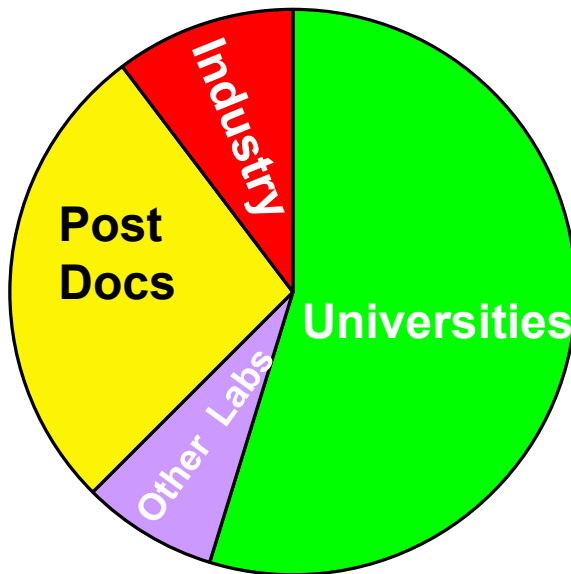
A DOE user facility dedicated to energy science and technology for the twenty-first century



- **Our research addresses**
 - Energy sciences
 - Energy efficiency
 - Environmental impact
 - Fuel flexibility
- **Our core programs provide**
 - Basic to applied research
 - Unique laser facilities
 - Partnerships with academia and industry

CRF user programs are highly successful

- We continue to host approximately 100 users per year
- University users predominate
- Significant industrial use, but few users in residence



University Education Programs at Sandia CA prepare Sandians for future assignments

46 Sandians in University Programs

Doctoral Studies Program (DSP)	1
One-Year-On-Campus (OYOC)	6
Special Masters Program (SMP)	6
University Part-time (UPT)	6
Tuition Assistance Program (TAP)	27

Degrees being Pursued

<u>Degree</u>	<u>Total</u>
Bachelors	12
Masters	24
PhD	2
Total	38

Major Schools Being Attended

<u>School</u>	<u>Students Attending</u>
ASU	1
Carnegie Mellon	1
Cornell	2
CSU Stanislaus	4
MIT	1
Stanford	7
UC Davis	3
UC Berkeley	4

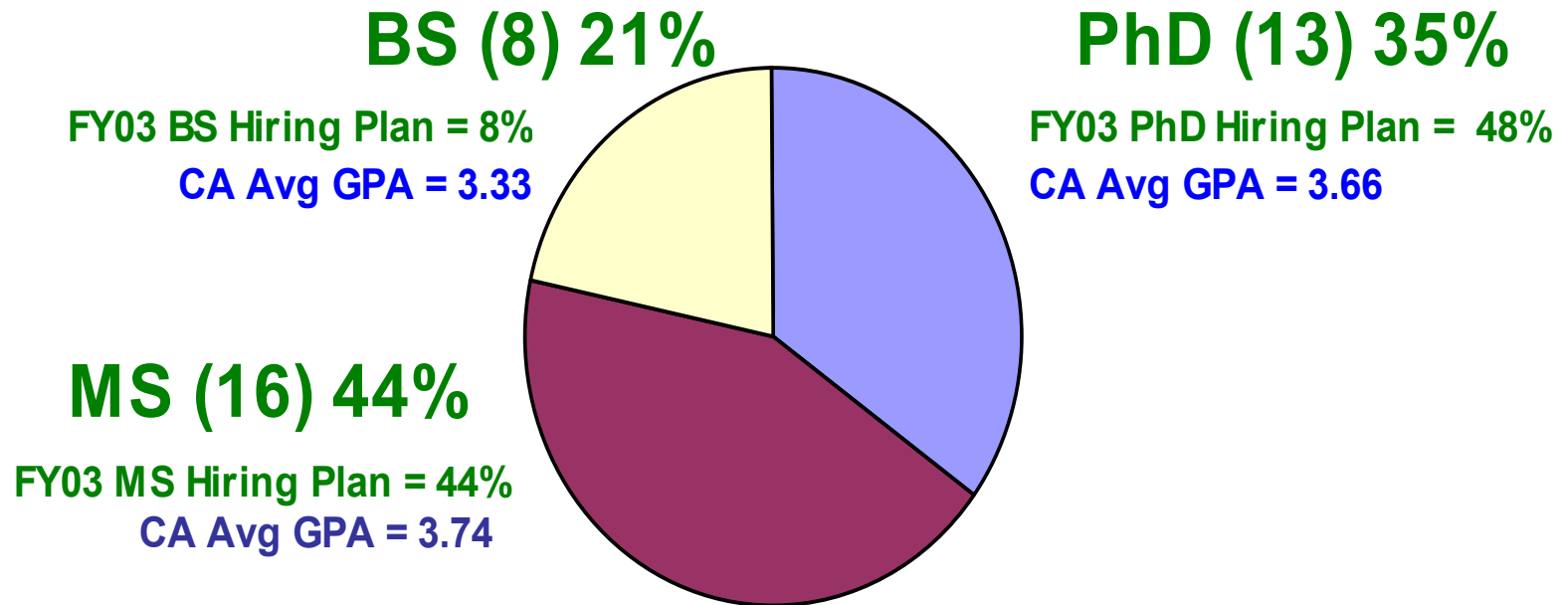
Initiated University of New Haven courses onsite

25 students attending class on-site this trimester

3 are Sandians. 6 Sandians have been accepted in the program

Additional students are taking courses online

Sandia CA FY03 Technical Staff GPA's by degree level and hiring schools



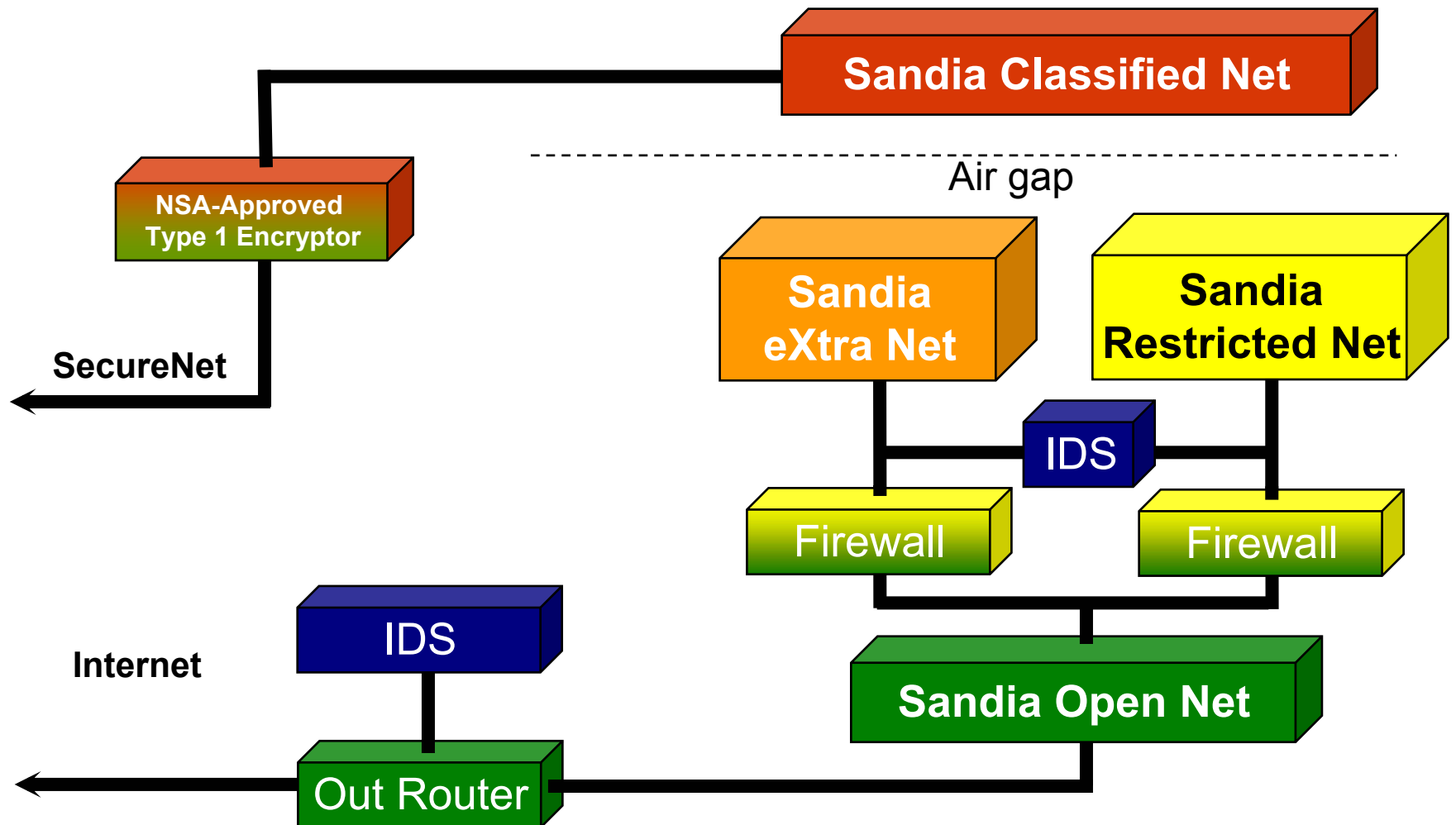
Data as of 5/30/03

Sandia CA uses a graded approach for site access

- Escorted and unescorted access differs between normal and after-hours
- All visitors approved for unescorted access must display with their badge a card identifying all areas they are authorized to access
- Access cards and badges are routinely checked by security forces during after-hours security patrols

	Limited Area	Property Protection Area	
		Normal Hours	After Hours
US Citizen Q/L	Yes	Yes	Yes
US Citizen Uncleared	Yes - with escort	Yes	Yes
US Citizen Visitor	Yes - with escort	Yes	Yes - with escort
Non US Citizen Visitor	No - unless specially approved and escorted	Yes - with security protections	<u>Non-Sensitive</u> Yes - with security protections <u>Sensitive</u> No - unless escorted by L or Q escort

Sandia CA's network infrastructure provides information access and protection



* IDS = Intrusion Detection System